SciTech Conference 2/3 October 2003
Taradale, Napier

Workshop: HSNO
Facilitator: Rex Alexander, Dunedin City Council

Presentation Notes

Introduction
Hazardous Substances and New Organisms (HSNO) Act 1996 & Regulations

Commencement Hazardous Substances: 2 July 2001

Transition:	1 July 2003	Explosives
	1 April 2003	Dangerous Goods and Scheduled Toxic Substances

Coverage: Except CL 7 (radioactive) and CL 6.2 (infectious)

Pan Lifecycle: Importation, manufacture, storage, use, transportation, disposal

HSNO controls the substance ONLY - RMA Controls the Site

Intent:
To reduce the likelihood of an unintended release of chemical energy, fire or explosion:
To control the adverse effects of any release of chemical energy, fire or explosion:

HSNO s.3 Act to bind the Crown

Health and safety in Employment Act 1992; includes

the Chief Executive and any employee of, or those employed to do any work for, a Crown Organisation. The definition of which has the same meaning as in s.4 of the Crown Organisations (Criminal Liability) Act 2002

Every governing body of a secondary school is deemed to be an agent or instrument of the Crown under the Education Act 1964 and subsequent amendments.

A secondary school is a place of work, at least for teachers, lab technicians and others employed at the school.

There is a duty in HSEA s.16 to ensure the place of work, and the vicinity of the place, are kept free from hazards that could harm others who are authorised to be in that place for any purpose including recreation and leisure. That means students!

Should any student or staff member suffer harm, the Crown Organisation may be subject to proceedings in its own name (without citing the Crown itself as a defendant) under the Health and safety in Employment Act 1992.

Please Note: The administration and enforcement of the HSNO Act will be carried out by OSH as a function of the HSE Act.

Prescriptive versus Performance legislation:

Prescriptive: e.g. Fire Resistance Rating
Isolation distance
Construction details
Container specifications and approvals
Signage - legally required signs specified in the regs

The previous Dangerous Goods Act was surprisingly performance oriented with many controls able to be modified through the overriding clause: "In the opinion of the Inspector."

Performance:
Shall not subject people where they "may legally be present" to:

More than *X* amount of heat radiation; or
More than 5 kPa of blast overpressure

Criteria for packaging specify performance measures for

Shock and impact forces
Integrity; to contain substance
Imperviousness to product contained

Signage requirements governed by:

Comprehensibility, durability, and clarity

Quote:
"I wish people wouldn't write performance regulations so prescriptively."

Dr. Bas Walker CEO ERMA NZ

Prescriptive legislation administered by enforcement Agencies against only those hazards for which they had legal jurisdiction - OSH and Territorial Local Authorities: Dangerous Goods Act 1974 covered Classes 2-5. Ministry of Health covered Classes 6 Toxics and 8 Corrosives.

HSNO introduces a hazard Matrix identifying all of the hazards a substance presents. Enforcement Agencies administer all classes within their traditional areas - workplaces, overview of public health , land use consenting etc.

ERMA NZ Transfer Reports: http://www.ermanz.govt.nz/hs/transfer-dg-reports.asp

Controls
Hazards are controlled by:

Compatibility
Quantity Limits
Location
Physical Safety Temperature Control

	Impact / Shock	
	Source of Ignition	Fire Electrical incl. static Friction
	and the related; Oxygen % in air	
	Isolation	Fire Resistance Rating Distance Compounding
Personnel	Qualifications	
	Experience	
	Personal Protective Equipment (PPE)	

Test Certificates
Transportation
Signage
Emergency Management
Disposal

HSNO Exempt Laboratories

Exempt Lab management is appropriate for University Chemistry faculties, Crown Research Institutes, and industrial research and development laboratories where work is undertaken on "non approved" substances.

Design and construction requirements are specified in the regulations.

Necessary to appoint a Lab Manager whose knowledge requirements are specified in the regulations:

The duty of a lab manager may be delegated (and recorded in writing) to cover absences

There are specific requirements for entry to the lab, restricting unauthorized persons and warning everyone through appropriate signage of the hazards within.

Labeling requirements for containers needs to include concentration and provide a warning of the hazardous properties of the substance. This extends to working containers and reaction vessels where the contents, or reactants respectively, remain for more than 48 hours.

The wording of both the HSNO Amendment Act in s.14 (repealing the original wording of s.33) and that of the Exempt Laboratories Regs in Reg. 4 - Application; is that the Exempt Lab Regulations apply to: ..."every laboratory in which any small scale use of hazardous substances in research and development, or teaching occurs." And; "nothing in this Act applies to..."

That makes the lab not only exempt from test certification but also monitoring by enforcement officers and this is a first. Although the Dangerous Goods Act exempted the Crown from licensing, fines, fees and forfeitures it did not exempt it from enforcement monitoring and the need to comply with the regulations. The Toxic Substances Act in s.3 also served to bind the Crown thereby allowing all classes of hazardous substances to be monitored by external agencies.

Now with HSNO we have legislation that exempts schools from external monitoring of hazardous substance compliance unless the Ministry of Education intends putting in place a monitoring regime. The Exempt Labs regulations require only that the hazardous substances be handled and stored as they would be under the controls regulations. Appointments to the position of lab manager at a school are internal in accordance with the powers given to the Board by the Education Act 1989: s.75 - Except to the extent that any enactment or the general law of New Zealand provides otherwise, a school's Board has complete discretion to control the management of the school as it thinks fit.

And an Example:

7 students burned in chemistry class

A flash fire burned seven students in a chemistry class when an experiment went awry Thursday Oct 11 2001 in Genoa-Kingston High School, USA, leaving one of the students in critical condition.

According to school Supt. Richard Leahy. "It's a very routine experiment, It's been done in the building many times. The experiment is conducted in almost every high school and college chemistry class in the country."

The instructor was using a solution of methyl alcohol, salt and water in an experiment to identify salts, such as sodium chloride and potassium chloride, by the colour of the flame they create. A ceramic loop was dipped in the solution then passed over a flame. "Some of the methyl alcohol ignited, causing the flash of fire (not an explosion)", officials said.

Leahy, who expressed regret over the accident, said the experiment was being taken by a veteran teacher. "We are terribly concerned about safety and welfare of all students," he said. "Nothing is more important."

Some of the Genoa-Kingston chemistry students, as well as about 30 students in an adjacent biology class, went through a decontamination process after the accident. The students showered and their clothing was placed in plastic bags.

Some comment on this report: A number of respondents to the lab safety forum that the report came from proposed safer alternatives. Yes, it may have happened in the US but the lessons are applicable to any high school teaching lab anywhere, whether or not they conduct this particular experiment. To cause a fire large enough to injure 7 students with 2nd and 3rd degree burns, a reasonable quantity of flammables must have been exposed to the source of ignition. Why? "Nothing is more important" than student safety? - well, for this to happen under the control of an experienced teacher, then he was either negligent, ignorant, or blase (or maybe just not there - See Exempt Lab reg 8(3)(b) - direct supervision by Person A). Could a similar accident happen in a NZ school - yes probably, the Science Guide to Schools notwithstanding:

Pre the above accident a person with that teacher's experience and qualifications would have seemed perfect for appointment by the school administration and Board to the position of Lab Manager.

And, why were those students, especially the ones in an adjacent class decontaminated?

Test Certifier / Enforcement Officer Compliance Option

Requirement for persons handling hazardous substances in quantities and hazard rating in excess of the values specified in the Controls regulations, to be "Approved Handlers."

Approved Handler knowledge requirements are specified in the Hazardous Substances (Personnel Qualifications) Regulations 2001 and are evaluated by Test Certifiers. There is initially a grandfather clause permitting those who have been working in the field (in compliance with the previous controls) to be approved for a period of 2 years. Thereafter Test Certification is every 5 years for those handling classes 1-5, 6, 8, & 9.

"Hazardous Substances Locations" and locations subject to "Hazardous Atmosphere Zone" requirements; storing, manufacturing, using, and disposing of hazardous substances of classes 1-5 over specified quantities, and depending on the hazard classification, are required to be test certified annually. Extensions up to 3 years are possible on application to ERMA.

Effectively Test Certification replaces Dangerous Goods licensing.

Typically the controls apply at 100kg of liquefiable flammable gas, 100m³ of permanent flammable gas, 100 litres of Class 3.1A, B, or C flammable liquid in closed containers, 25 litres when decanting, 5 litres when open occasionally, and 1 litre open continuously.

The controls placed on gases during the Transfer process for "Hazardous Atmosphere Zones" vary as to quantity from those in the regulation in Table 3 Schedule 3 to be consistent with the above quantities.

Approved Handler quantity limits parallel those above.

The controls for petrol and LPG have been varied to reflect the practicality of existing accepted practices. Please note that the control variations apply to service station forecourts and retail outlets.

Disposal

Containers for storing and collecting hazardous waste shall not exceed 5 litres capacity for category A (tracked) substances and 20 litres for all others.

Waste containers not kept in storage cabinets shall be provided with a secondary spill containment tray. Containers shall not be stored under or between benches, and shall especially not be stored in a means of Fire Egress.

Note: Disposal of *Hazardous Substances* are subject to the Resource Management Act and Council By-Laws in addition to HSNO requirements. The following specify the HSNO requirements only.

In general, substances must be disposed of by treatment using a method that changes the characteristics or composition of the substance so it is no longer a hazardous substance, or by exporting the substance from New Zealand as waste.

A summary of treatment methods is given in the following table. Detailed information is provided after the summary table.

Class	Disposal Treatment Systems	Methods Specifically Excluded
1	Controlled detonation, deflagration, or burning.	Landfill or sewage
2,3,4	Controlled burning Controlled environmental discharge for (2.1.1, 2.1.2, 3.1, or 4.1.1)	Landfill or sewage
5	Controlled burning Controlled and segregated landfill	Sewage
6,8	Environmental discharge less than Tolerable Exposure Limit (TEL) (N.B. Can exceed TEL if rapidly biodegradable and products of degradation are not hazardous substances). Landfill, sewage, combustion provided these techniques change the substance to non-hazardous.	Dilution for class 6
9	Environmental discharge less than Environmental Exposure Limit (EEL) Landfill, sewage, combustion provided these technologies change the substance to non-hazardous If bio-accumulative and not rapidly degradable, then treat so hazardous substance concentration is less than 1% by volume.	Dilution
Packages	Make incapable of containing hazardous substance and treat as for substance it contained and taking account of the material the package is made of. Note: Disposal of packages is not required for classes 1 to 5 packages if the contents have been made non-hazardous, or for classes 6 to 9 if contents are diluted to below hazard threshold.	Use for some other substance

Emergency Management:

NB: Emergency Management Plans are required for Exempt Laboratories regardless of the quantity of hazardous substances stored. For Hazardous Substances Locations complying with the regulations, quantity trigger limits are contained in Schedule 4 of the Hazardous Substances (Emergency Management) Regulations 2001.

The following information must be provided:

A location and description of the material and equipment needed to put out a fire involving the product including the steps to be taken; and

- a 24 hour emergency service telephone number;
- the information must be available within 10 seconds.

NB: Information complying with Land Transport Rule 45001 or Maritime Rule 24A Carriage of Cargoes – DG or Civil Aviation Rule 92 Carriage of Dangerous Goods is deemed to comply

An emergency response plan must describe all of the reasonably likely emergencies that may arise from the breach or failure of the controls. The Plan shall be exercised every 12 months with records retained for 2 years.

Contents of plans
An emergency response plan must, for each reasonably likely emergency describe the actions to be taken to:

- warn people at the place, and in surrounding areas that may be adversely affected by the emergency, that an emergency has occurred; and

- advise those people about the actions they should take to protect themselves; and

- help or treat any person injured in the emergency; and

- manage the emergency so that its adverse effects are first restricted to the area initially affected, then as soon as practicable reduced in severity, then if reasonably possible eliminated; and

- if any of the substances concerned remain, re-establish the controls imposed on it when it was approved; and

  identify every person with responsibility for undertaking any of the actions described and give information on: Contact details, skills, actions, and sequence of actions

The Plan must make provision for signage to be placed that advises the action to be taken in an emergency The signage shall meet the requirements of the Hazardous Substances (Identification) Regulations 2001.

The plan must provide for the possibility of the hazardous substance contacting any incompatible substance or ignition energy source.
Issues to consider for school labs:

- Location of telephones for notification of emergencies
- Location of fire alarms and appropriateness of their use
- Location of extinguishers and appropriate training
- Availability and suitability of first aid treatment
- Decontamination issues
- Reporting procedures